THE

VETERINARY JOURNAL

APRIL, 1914.

Editorial.

OUR COLLEAGUES IN THE AMERICAN ARMY.

For a long time the position of our colleagues in the American Army has left much to be desired; in fact, they may almost truly be said to have had no military status at all, and the state of affairs was well-nigh intolerable to them as educated men belonging to one of the professions. Backed up by the American Veterinary Medical Association a number of civilian practitioners, foremost amongst whom have been Drs. Horace Hoskins, John Mohler and Adolph Eichhorn, have for a long time been hammering away at the Government authorities to get this state of affairs altered and a proper Army Veterinary Service established on similar lines to those in all other civilized countries. The great importance of military rank to those who serve in the Army, whether officers of a special department or combatants, cannot be too much insisted upon, and the difference in status between the position of affairs where this is present and where this is absent is too palpable even for discussion.

It is astonishing that a great and civilized country like the United States has for so long persistently refused to grant what even the turbulent Balkan States consider a necessity, and that in their military organization there is no recognition of the veterinary profession as a profession. At the present time the veterinarian is a kind of nondescript, neither an officer nor a man, in fact, merely a "tweeny," and in such a derogatory place that

it is not a position for which there is much competition nor for which the best men will apply.

If only all the qualified veterinarians would but hang together and all firmly boycott the Service it would not take many months for their object to be gained, for horses and mules must have doctors who understand their ailments and meat must be properly inspected. Chaos is bound to ensue when one integral part of the whole becomes disaffected and stands firm to its point, and that the veterinarian is essential has been proved over and over again in all armies and all wars.

The Army Veterinary Service Bill at present before the United States Congress has passed the House Military Committee on a unanimous vote, and it now only awaits confirmation when brought before the House.

That it may not pass is possible even yet, and the final vote is awaited by every American veterinarian with the greatest anxiety.

We, their British colleagues, can assure them, from our side of the water, that they have for a long time had our earnest sympathy, and that we wish them the greatest possible success.

Original Communication.

A FIFTH SEASON'S REPORT UPON THE PERMANENT VALUE OF THE VENTRICLE STRIPPING OPERATION FOR "ROARING."

By FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.

Honorary Veterinary Surgeon to His Majesty the King, and formerly Professor in the Royal Veterinary College, London.

Kensington, W.

In fulfilment of a promise made to the readers of THE VETERINARY JOURNAL some years ago, I am presenting another year's report upon the value of the ventricle stripping operation, first brought into prominence as a practical measure by Dr. Williams,* of Cornell University, for "roaring" in horses.

There is no question but that the operation can be said to have attained success in a very large number of cases, a further year's experience being that the proportion stated in THE VETERINARY JOURNAL last year† (fully 75 per cent. of hunters and 90 to 95 per cent. of carriage horses) of useless horses made useful, is by no means exaggerated.

Similar favourable reports have now been published or received from various parts of the world, notably in America by Merrilat, Cary, Blattenberg, and others; in Italy by Professor Antonini‡; in Germany by Professor Eberlein§; in France by Professor Cadiot‖ and M. Victor Drouin¶; in Hungary and Austria by Mr. W. Reynolds, M.R.C.V.S.,¶ and the operation may truly be said to have become a godsend in its value to both owner and patient, in preference to the only other previously known method of relief, viz., the tracheotomy tube.

Even if the operation only gave relief for one season, and the tube had then to be inserted it would be worth doing, for every owner or stud groom who has had experience of the cleansing and general care required by a "tubed" hunter will without hesitation assert that if the evil day *can* be staved off for even only so short a period as one year it is worth while making the attempt; and one very strong point in favour of this operation is, that even if it does not succeed the horse is just as good as he was before for the insertion of the tube.

There have been, in my experience, so far as I have been able to trace up to the present, less that 2 per cent. of relapses, and most of these did one or two season's hunting before it occurred. I write now from the results of 837 individual horses whose respective histories since the operations I have kept in touch with.

The first two horses operated upon in England, which were

---

* *Proceedings of the American Veterinary Medical Association*, 1906, 1907, 1911.

† THE VETERINARY JOURNAL, April, 1913, "The Fourth Season's Report upon the Permanent Value of the Ventricle Stripping Operation for 'Roaring.'"

‡ "Il Cornegio e la nuova Operazione" (Congresso Nazionale Veterinario, Turino, 14-16 Settembre, 1911).

§ THE VETERINARY JOURNAL, September, 1912 (a translation).

‖ *Receuil de Médecine Vétérinaire.*

¶ Communicated.

done by Dr. Williams in September, 1909, are still at work to the satisfaction of their respective owners.

The list given on pp. 168 to 171 is a continuation of the history for another year of 100 cases, the same which were reported upon in THE VETERINARY JOURNAL for January, 1911.

During the past year, on numerous occasions at Tattersall's, Warner Sheppard and Wade (Leicester), and other places, horses which have been operated upon have been entered in the catalogues as " operated upon for wind," and described as " practically cured," thus showing that the vendors are not afraid to admit the fact, and the prices reached have been quite on a *par* with those of average hunters.

I know of no reason at present for altering any opinion expressed in the reports of previous years, and the following brief extracts from letters of owners whose horses are in the above list are still further confirmatory evidence of the permanent value of the results obtained:—

Case 8.—February 24, 1914. " The bay horse ' Newsboy ' is dead. He broke his leg in the hunting field, going well to the last, although making a noise.

" The grey horse seems to be quite cured, gallops on and does not tire, and makes no perceptible noise; would probably pass a vet."

Case 18.—Owner wrote, February 26, 1914: " The chestnut horse is going much better this season than he did last season. He is in much better condition. He was out hunting to-day with the Enfield Chase Staghounds, and I took particular notice of him; and I must say he went remarkably well. He was well up to the front all the time, which was an hour and fifteen minutes. He has hunted twice this week, and he is hunting again on Saturday.

" The only thing I can see against the horse is that he has a little discharge from the nose, but not so bad as it was last winter. He is a *real good hunter.*"

Case 25.—At first the result was so excellent that, although the horse was a bad roarer prior to operation, both the owner and a well-known hunting veterinary surgeon considered the beast to be " sound in wind," and a certificate was given to that effect. Some months later, however, after galloping about one and a half miles a curious habit of gulping would come on, and if not allowed to slacken speed the animal was threatened with dyspnœa. This would pass off in a few minutes when pulled up, and only reappear after a hard gallop.

As only one side had been done, it was decided to reopen the larynx and strip the right ventricle. This was done on November 23, 1911, and a V-shaped portion of the soft palate excised, as this appeared abnormally relaxed and enlarged. The result was to temporarily benefit the horse, and the animal went back to hunting for some months.

The gulping, however, returned, and after the hunting season the horse was shot (July, 1913).

Case 29.—February 23, 1914: " The gelding ' Challenger ' is still hunting and going very well. My son has him at Cambridge."

Case 55.—February 25, 1914: "The 'tubed' horse that you did in 1910 goes splendidly. He makes a slight noise, but it does not stop him at all."

Case 70.—February, 1914: "The owner is pleased to say that the mare operated on four years ago has got no worse since she was done. She still makes a noise when galloping, but it does not seem to distress her."

Case 79.—March 28, 1914. Owner wrote: "The chestnut horse operated on for his wind in May, 1910, makes very little noise except when he is very fresh, or pulls hard in very heavy land. It is a certainty that if the operation had not been performed on him I should never have gone on riding him, as I hate a noisy horse."

Case 81.—March 27, 1914. Owner wrote: "I am pleased to state that my horse you operated upon in May, 1910, is still going well.

"I am not certain that he would pass the vet., but he gallops strong and well and does not roar; he makes a little noise, but it is not perceptible casually, and does not stop him; before he roared at a trot."

Case 89.—February 23, 1914: "I am still of opinion that the operation for roaring is a very great success.

"The brown horse you first of all only did on one side, and the year after completed the other side, is really wonderful. Just when first starting off you can hear him slightly, but afterwards not at all."

Case 97.—March 28, 1914. Owner wrote: "I have much pleasure in informing you that my roan horse which you operated on (I think four years ago) has been going thoroughly strong and sound. He has again carried my huntsman all this season and has put in an exceptionally hard time, doing very often other horses' work, and has not been sick or sorry once. A *most* remarkable success."

Case 108.—March 27, 1914. Owner wrote: "The operation you performed on my bay hunter in 1910 has been most successful. I do not say there is no noise, for I think in that respect the horse is going back; but he is going as strong as ever this season, and his wind does not seem to distress him."

Case 115.—March 27, 1914: "The grey hunter operated on in June, 1910, is going wonderfully well, and 'hops the top twig' twice a week. He makes a little noise, but it does not stop him at all, and is nothing to what it was before operation."—M.R.C.V.S.

Case 116.—March 29, 1914. Owner wrote: "I am glad to e able to tell you that the chestnut hunter you operated on for roaring in June, 1910, is still going on satisfactorily."

Case 117.—February 25, 1914: "The horse of mine on which you operated some four years ago has been hunting all this year; was, in fact, out on Monday last. He makes a noise, and it stops him occasionally, but for Sussex he is as useful a horse as one wants, as the wind affection does not interfere with him in a hunt in that country, though I sometimes notice it on the Downs."

Cases 119 and 120.—On March 27 the veterinary surgeon wrote:

No. of case	Date of operation	Class of horse	Age	Description before operation	Result on first trial	Report in January, 1911	Report in April, 1912	Report in April, 1913	Present report (March, 1914)
	1909								
1	Sept. 10	Hunter ...	10	Bad whistler ...	Excellent	Excellent	Excellent ...	Excellent	Excellent.
2	,,	,, ...	9 or 10	,, ...	,, ...	,, ...	,, ...	,, ...	,,
	1910								
5	Jan. 25	,, ...	7	Bad roarer ...	Much improved ...	Can gallop freely without distress	Satisfactory	Satisfactory	Unable to trace.
8	Feb. 3	,, ...	10	,, ...	,, ...	Can gallop without distress, although makes noise Second operation, Aug. 30	Satisfactory	Excellent	Excellent till destroyed for broken leg.
10	Feb. 15	,, ...	6	Bad roarer ...	,, ...	Excellent	Excellent ...	Sold and lost trace of.	
11	,,	,, ...	8	Bad whistler ...	Excellent	Practically cured, perhaps a little thick in wind	,,	Excellent	Sold and lost trace of.
18	April 1	,, ...	7	Roarer	Not very satisfactory	Satisfactory ...	See notes ...	Hunting well, but still has nasal discharge	Much better than last year.
20	April 6	,, ...	...	,, ...	Good...	,, ...	Satisfactory	Satisfactory	Satisfactory.
22	,,	,, ...	...	,, ...	Excellent	Excellent	Excellent ...	Excellent	Developed heart trouble. Destroyed.
25	April 10	,, ...	6	Bad roarer ...	,, ...	,, ...	Satisfactory	Satisfactory	Dead. See note.
29	,,	,, ...	8	Roarer	Not good	Second operation, Sept. 29. Now satisfactory	,,	,, ...	Satisfactory.
31	April 15	Racer ...	3	Bad roarer ...	Slight whistler, but no distress	Slight whistler, but no distress	Satisfactory	Sold; unable to trace	—
40	,,	Hunter ...	5	Bad whistler ...	Excellent	Excellent	Excellent ...	Excellent	Destroyed for lameness.
41	April 19	,, ...	8	Confirmed roarer	,, ...	,, ...	Excellent Since sold for £100	Makes a noise again, but can hunt without distress.	Unable to trace.
44	April 23	,, ...	9	Bad roarer ...	,, ...	,, ...	Excellent ...	Excellent	Excellent.
45	April 24	,, ...	5	Bad whistler ...	,, ...	,, ...	Satisfactory	Satisfactory	Satisfactory until shot after an accident.
51	April 24	,, ...	7	,, ...	,, ...	,, ...	Excellent ...	Sold and lost sight of	—
53	April 27	,, ...	7	,, ...	,, ...	,, ...	,, ...	Excellent	Sold and lost sight of.

53	April 27	,, ...	7	,, ...	,, ...	,, ...	,, ...		sight of.
55	April 27	Hunter ...	9	Bad roarer ...	Satisfactory	Satisfactory ...	Excellent ...	Excellent	Excellent.
57	,,	,, ...	7	Bad whistler ...	Excellent	Excellent	Satisfactory	Relapsed and was shot	—
58	April 30	,, ...	7	Bad roarer ..	Improved	Satisfactory ...	,, ...	Sold and lost sight of...	Unable to trace further.
64	May 4	,, ...	...	Moderate whistler	Excellent	Excellent	Excellent ...	Sold for £200 and lost sight of	Unable to trace further.
68	May 7	Van gelding..	7	Bad roarer ...	,, ...	Satisfactory ...	Satisfactory	Still satisfactory ...	Satisfactory.
70	May 8	Hunter ...	6	,, ..	,, ...	Excellent	Excellent ...	Excellent	Excellent.
71	,,	,, ...	6	,, ...	Temporarily better...	Second operation, Sept. 9. Excellent	,, ...	,, ...	,,
73	May 10	,, ...	16	,, ...	Excellent	.. ..	,, ..	,, ...	Excellent.
79	May 22	,, ...	12	,, ...	Not very satisfactory	Still some noise, but hunting without distress	Satisfactory	Satisfactory. See notes	Satisfactory.
81	May 23	,, ...	...	,, ...	Excellent	Excellent	Excellent ...	Excellent	Excellent.
85	May 28	Harness horse	9	,, ...	Improved	Second operation, August 3. Now excellent	Satisfactory	Satisfactory	Satisfactory.
87	May 30	Hunter ...	6	,, ...	Excellent	Excellent	Excellent ...	Excellent	Sold and lost sight of.
89	June 1	,, ...	9	Roarer	,, ...	,, ...	,, ...	,, ...	Excellent.
92	June 5	,, ...	9 or 10	Bad whistler ...	Not very satisfactory	Now satisfactory...	Satisfactory	Slight relapse, but still hunting	Has been shot.
93	,,	,, ...	7	Roarer	Satisfactory	Satisfactory ...	,, ...	Slight relapse	Sold and lost sight of.
96	June 9	,, ...	15	Bad roarer ...	,, ...	,, ...	Excellent ...	Excellent	Excellent.
97	June 10	,, ...	9	,, ...	Not satisfactory ...	Excellent	,, ...	,,	,,
98	June 11	,, ...	8	,, ...	Satisfactory	Satisfactory ...	Satisfactory	Sold and lost sight of...	Unable to trace further.
100	June 12	Russian Orloff trotter	4	,, ...	Excellent	Excellent	Excellent ...	Excellent	Excellent.
101	,,	Russian trotter	4	,, ...	,, ...	,, ...	,, ...	Has developed very severe stringha't	Unable to trace further.
105	June 15	Hunter ...	6	,, ...	No improvement ...	Second operation. Improving	,, ...	Relapsed	Sold and lost sight of.
106	,,	,, ...	12	,, ...	Improved, but still makes noise	Second operation, Sept. 10. Now satisfactory	,, ...	Satisfactory. See notes	Destroyed for injury.
107	June 16	,, ...	7	,, ...	Satisfactory	Satisfactory ...	Satisfactory	Satisfactory	Developed ring-bone and sold.
108	,,	,, ...	7	Roarer	Excellent	Excellent ...	Excellent ...	Excellent	Excellent.

No. of case	Date of operation	Class of horse	Age	Description before operation	Result of first trial	Report in January, 1911	Report in April, 1912	Report in April, 1913	Present report (March, 1914)
	1910								
111	June 18	Hunter ...	10	Bad roarer ...	Not good (2nd operation Oct. 20)	Now satisfactory...	Excellent ...	Excellent	Satisfactory.
113	June 23	Shire... ...	3	Roarer	Improved	... ...	,, ...	Has relapsed	Unable to trace further.
115	June 26	Hunter ...	6	,, ...	Much improved ...	Satisfactory ...	Satisfactory	Satisfactory	Satisfactory.
116	June 27	,, ...	8	Whistler ...	Excellent	Excellent ...	,, ...	,,	,,
117	,,	,, ...	...	Roarer	Satisfactory	Satisfactory ...	,, ...	,, ...	,,
118	,,	,, ...	...	Bad roarer ...	,, ...	,, ...	,, ...	Died. See notes ...	—
119	June 29	,, ...	12	Roarer	Excellent	Excellent ...	Excellent ...	Excellent	Excellent.
120	,,	,, ...	8	Bad roarer ...	,, ...	,, ...	,, ...	,, ...	Sold and lost sight of.
121	July 1	Polo Pony ...	7	,, ...	Improved	Satisfactory ...	,, ...	,, ...	Excellent.
122	,,	Hunter ...	5	Whistler ...	,, ...	Excellent ...	,, ...	,, ...	,,
126	July 5	,, ...	8	Bad roarer ...	Satisfactory	Satisfactory ...	Satisfactory	Satisfactory	Sold and lost sight of.
127	,,	,, ...	9	,, ...	,, ...	,, ...	,,	,, ...	Sold and lost sight of.
130	July 8	,, ...	3	Roarer	,, ...	,, ...	,,	,, ...	Sold and lost sight of. Unable to trace.
131	,,	,, ...	6	Bad whistler ...	,, ...	,, ...	,,	,, ...	Satisfactory.
134	July 11	Carriage ...	7	Bad roarer ...	,, ...	,, ...	,,	Satisfactory when sold; since lost sight of	—
136	July 14	Hunter ...	6	Very bad roarer	,, ...	,, ...	,,	Satisfactory. See notes	Shot for varicular disease.
137	July 15	,, ...	8	Bad whistler ...	Excellent	Excellent ...	Excellent ...	Excellent	Excellent.
138	,,	,, ...	7	Bad roarer ...	,, ...	,, ...	,, ...	Satisfactory	Satisfactory.
140	July 21	,, ...	6	Roarer	,, ...	,, ...	Satisfactory	Has been sold and lost sight of	—
141	July 24	Hackney ...	5	Bad roarer ...	,, ...	,, ...	,,	Satisfactory	Satisfactory.
145	July 28	Hunter ...	4	Bad whistler ...	,, ...	,, ...	Excellent. Sold since for £120	Excellent, see notes ...	Excellent.
149	,,	Racer ...	5	Bad roarer ...	,, ...	,, ...	Excellent ...	Sold and lost sight of...	—
151	Aug. 2	Hunter ...	8	Bad whistler ...	,, ...	,, ...	,, ...	Excellent. See notes...	Excellent.
152	,,	,, ...	9	Bad roarer ...	,, ...	,, ...	,, ...	,, ...	,,
153	Aug. 3	,, ...	10	,, ...	,, ...	,, ...	,, ...	,, ...	,,

160	Aug. 5	Hunter ...	6	Slight whistler ...	Excellent	Excellent	Excellent ...	Was sold and lost sight of	—
161	Aug. 6	,, ...	9	Roarer	Not good	Improving ...	Satisfactory	Satisfactory	Satisfactory.
162	,,	,, ...	7	Bad roarer ...	Satisfactory	Satisfactory ...	,,	,, ...	,,
163	,,	,, ...	6	,, ...	Excellent	Excellent	Excellent ...	,, ...	Excellent. See notes.
167	Aug. 9	Carriage ...	9	,, ...	,, ...	,, ...	Satisfactory	,, ...	Satisfactory.
170	Aug. 12	Hunter ...	5	,, ...	,, ...	,, ...	Excellent ... Sold for £150	Excellent	Lost trace of. Now in Belgium.
171	,,	,, ...	5	Bad whistler ...	,, ...	,, ...	Satisfactory	Sold and lost sight of ...	Unable to trace further.
172	,,	,, ...	5	,, ...	,, ...	,, ...	,, ...	,, ,, ...	,, ,,
173	,,	,, ...	5	,, ...	,, ...	,, ...	,, ..	,, ,, ...	,, ,,
174	Aug. 19	Harness ...	10	Roarer	Satisfactory	Satisfactory ...	,, ...	Satisfactory	Excellent.
176	Aug. 20	Hunter ...	6	,, ...	Excellent	Excellent	,, ...	,, ...	Satisfactory.
178	,,	,, ...	Aged	Whistler ...	Satisfactory	Satisfactory ...	,, ...	Sold and lost sight of ...	—
181	Aug. 21	,, ...	5	Roarer	Excellent	Excellent	Excellent ...	Satisfactory	Sold and lost sight of.
182	Aug. 22	,, ...	6	,, ...	,, ...	,, ...	,, ...	Excellent	Excellent.
183	,,	Shire ..	3	Bad roarer ...	,, ...	,, ...	,, ...	,, ...	,,
185	Aug. 26	Hunter ...	9	,, ..	Satisfactory	Satisfactory ...	,, ..	Satisfactory. See notes	Satisfactory.
186	,,	,, ...	4	,, ...	,, ...	,, ...	Satisfactory	Sold and lost sight of ...	—
190	Sept. 8	,, ...	4½	Whistler ...	,, ...	Excellent ...	Excellent ...	Satisfactory	Satisfactory.
191	Sept. 13	,, ...	5	Bad roarer ...	,, ...	Satisfactory ...	Satisfactory	Excellent. See notes ...	Excellent.
192	Sept. 14	Trooper ...	11	,, ...	,, ...	,, ...	,,	Satisfactory	Satisfactory.
193	,,	,, ...	7	,, ...	,, ...	,, ...	,,	,, ...	Sold and lost sight of.
194	,,	,, ...	6	,, ...	Excellent	Excellent	,,	,, ...	Satisfactory.
195	Sept. 17	Carriage ...	5	,, ...	,, ...	,, ...	,,	,, ...	,,
1 6	,,	Hunter ...	12	Roarer	Satisfactory	Satisfactory ...	,,	Relapsed and been tubed	Hunting with tube.
197	,,	,, ...	8	,, ...	,, ...	,, ...	,,	Satisfactory. See notes	Satisfactory.
198	Sept. 18	,, ...	5	Bad roarer ...	,, ...	,, ...	,,	Satisfactory	Sold. Unable to trace.
199	Sept. 20	,, ...	12	,, ...	,, ...	,, ...	,,	,, ...	Satisfactory.
203	Oct. 1	,, ...	8	,, ...	Bad	Excellent	Excellent ...	See notes	Sold and lost sight of.
204	Oct. 4	,, ...	9	Roarer	Satisfactory	Satisfactory ...	Satisfactory	Satisfactory	Satisfactory until destroyed.
205	,,	Pony ...	Aged	Bad Roarer ...	Excellent	Excellent	Excellent ...	Now dead	—
206	Oct. 7	Hunter ...	7	Bad whistler ...	,, ...	,, ...	,, ...	Excellent	Excellent.
208	,,	,, ...	5	Whistler ...	,, ...	,, ...	,, ...	,, ...	Satisfactory.
216	,,	Harness ...	8	,, ...	,, ...	,, ...	,, ...	Satisfactory	Excellent.

"I have spoken to Colonel K——, and he says 'Puggy' is still going well, and that the operation is a great success.

"Lord L——'s horse was sold at Leicester last autumn, and I have lost sight of him, but he was quite all right then."

Case 129.—February 23, 1914: "The mare 'Cinderella' is still carrying me as well as ever, never 'sick or sorry,' and I may fairly repeat and confirm contents of my letter of March 24, 1913."

Cases 137 and 138.—On March 16 the veterinary surgeon wrote: "Colonel M——'s hunter has been sold, and was almost cured. The operation was a success. Captain C——'s horse has been hunting and doing military work ever since, and is practically all right."

Case 141.—March 27, 1914: "The chestnut hackney gelding which you operated upon for roaring in July, 1910, was still going on satisfactorily up to last May, when it was sold by auction with the other horses."—M.R.C.V.S.

Case 151.—February 22, 1914: "'John Peel' is a great success, and makes no noise at all after three hard seasons."

Case 155.—March 14, 1914: "'Scarlet Runner' is going 'tip-top' this season."

Cases 161, 162, 163.—On March 14 the veterinary surgeon with whom these cases were operated upon in consultation wrote: "Colonel L——'s horse is still carrying him 'the best,' and Miss A——'s horse, too, went splendidly this season, whilst Mr. R——'s horse won a Point-to-Point last week for its new owner."

Case 174.—March 27, 1914. The veterinary surgeon wrote: "Miss H——'s bay horse carried her to hounds well, and also did his harness work in the summer without any distress, although he always made a slight noise. As this horse went a roarer after a very acute attack of pneumonia, he was a distinct success, as previous to the operation he was worthless. Unfortunately he split a pastern and was destroyed."

Case 191.—March 7, 1914: "The grey hunter is going excellently; makes a blowing noise only. Worth £80 at least."

Case 197.—In a letter dated March 15, 1914, the owner wrote: "I have no change to report in my horse, 'Captain Kettle'; he fully maintains the great improvement made in him by your operation.

"I have hunted him all the season with the Mid-Kent Staghounds—a very big and heavy country—we have had some very fast runs, and he has not been distressed. Of course, he still makes a slight noise when galloping fast in heavy going, and I occasionally have to slow him down for a minute or two, but apart from this his wind seems quite good. This result is very satisfactory to me, as he is the best horse I have ever ridden, and I value him much. He was turned out to grass all last summer."

Case 204.—March 15, 1914: "This horse was a great success, and could gallop to the end of any hunt without any sign of distress. The animal is now dead, having got paralysis of hind quarters, for which it was destroyed."

Case 206.—March 16, 1914: "I sold the horse last year that you operated upon for me. The result of the operation appeared to be permanent. The horse was very much hindered by his wind before the operation, but afterwards it was able to hunt without inconvenience. He was hunting all last season and this."

Case 216.—March, 1914: "The roan mare is very satisfactory, and going better than ever she did. The result of the operation is still quite successful."

General Articles.

THE PUBLIC ABATTOIR AND DESCRIPTION OF THE NEW BUILDINGS AND PLANT OF BELFAST.*

During the nine years 1855 to 1864, while the famous Chancery suit of "Rea *v.* the Belfast Corporation" was proceeding, although Belfast was rapidly increasing in population, valuation and area, municipal enterprise was practically at a standstill; but the incubus of the ligitation once removed the town rapidly made up the leeway of its paralysed progress, and amongst many other reforms of the next few years it was decided to build Belfast's first public slaughter-house.

Previously, animals were slaughtered for food in Belfast at such time and place, and under such circumstances, as the owner thought fit, without supervision or regulation of any kind—generally in the small yard of the butcher's shop—a condition of affairs often inseparable from cruelty, uncleanliness and insanitary surroundings. That some of these places were of fair size, however, may be inferred from the fact that Benn, in his "History of Belfast," says, "in 1763, a small society of very poor people met in an old slaughter-house for worship."

As a matter of public convenience, perhaps, rather than of public health, but doubtless, also, with an eye to increased municipal revenue, the Corporation, on the advice of a deputation, built the present slaughter-house in M'Auley Street in 1869 on the Parisian model, at a cost of £33,203, Paris possessing at that time the finest abattoir in Europe.

In 1883 accommodation became so restricted that the slaughter-house was enlarged, at a cost of £3,000, and some years later "hanging rooms" and more modern equipment were provided.

As an indication of the enormous increase of business at the abattoir it may be stated that the number of animals of all kinds killed during the year 1912 was 81,783, as compared with 1,050

* Reproduced by special permission.

killed in 1870, when the abattoir was first opened. For a long time it has been felt that alterations and additions to the present buildings had reached their limit, and that the march of sanitary science and growing demand for space and accommodation, consequent upon the rapid development of a great city, have made it imperative that an abattoir commensurate with the size and importance of Belfast should be erected without further delay.

For a period of seventeen years the movement to build a new abattoir ebbed and flowed with varying degrees of intensity, and with this movement the name of the present Chairman of the Markets Committee (Dr. Henry O'Neill, B.L.) has been indissolubly associated.

The Markets Committee, in loyal support of their Chairman, brought the movement to a definite and final issue in 1909, when they obtained the sanction of the Council to the erection of a new abattoir in accordance with plans prepared by the City Surveyor, which were based upon the report of a deputation of the Markets Committee appointed in the same year.

The site for the new abattoir in Stewart Street was selected because of its close proximity to the markets, cattle sale yards and railway, so that animals could be delivered direct without crossing the city. The total area of the site is 3 acres 3 roods and 8 perches, and the area covered by buildings and passages 3¼ acres, thus leaving a small portion available for further expansion, which, however, can be increased by the appropriation of part of the adjoining Market Yard.

Although the area covered by the new buildings is apparently small for the size of the city it must not be forgotten that it is considerably larger than the built-upon area of the old abattoir, which measures somewhat less than one acre, and that every effort has been made to use the ground to the best advantage, and to reduce the time of each operation to a minimum by the introduction of the most up-to-date equipment.

The abattoir has been arranged for the slaughter of cattle, sheep and pigs, and each of the three departments has been kept separate, that is to say, there is a separate lairage, slaughter hall and hanging hall for each kind of animal, the offal only being dealt with in common.

The abattoir has been planned so that the tripery, engine and boiler house, cattle, sheep and pig hanging rooms, and cold

storage abut directly upon the main thoroughfare, and separate passages for cattle have been provided which will prevent obstruction.

Mr. J. A. JORDAN, M.R.C.V.S., City Veterinarian.

The buildings, which have been designed in a simple style, are constructed of red brick with stone dressings, and are roofed with slate. All internal angles at junctions of walls with each other and with floors have been formed with hollow curved

Mr. J. A. JORDAN, M.R.C.V.S., City Veterinarian, and Meat Inspection Staff.

bricks, and where considered necessary the walls are faced with a glazed brick dado 6 ft. high.

The main road inside the abattoir for butchers' carts, &c., has been finished with lithomac on concrete, and the passages

for cattle, &c., where there will be no vehicular traffic, are of concrete with granolithic finish.

The administration block contains the Veterinary Surgeon's offices and laboratory, Meat Inspector's office, ticket office, and Manager's house; also a cloak room, baths, lavatories, and mess room for butchers, which are approached separately and have no direct connection with the administrative department.

The main entrance passage to the abattoir is flanked on the north side by the administration department, and on the south side by a railed-in passage for cattle.

The cattle entrance passage is provided with cross gates at intervals so that it can be formed into pens while the beasts are being counted and tickets issued.

The cattle lairage is 220 ft. long by 48 ft. wide, and provides accommodation for 250 beasts.

The lairage has been arranged with transverse passages, and the cattle divisions, which are at right-angles to same, abut upon feeding passages alternating with entry and exit passages.

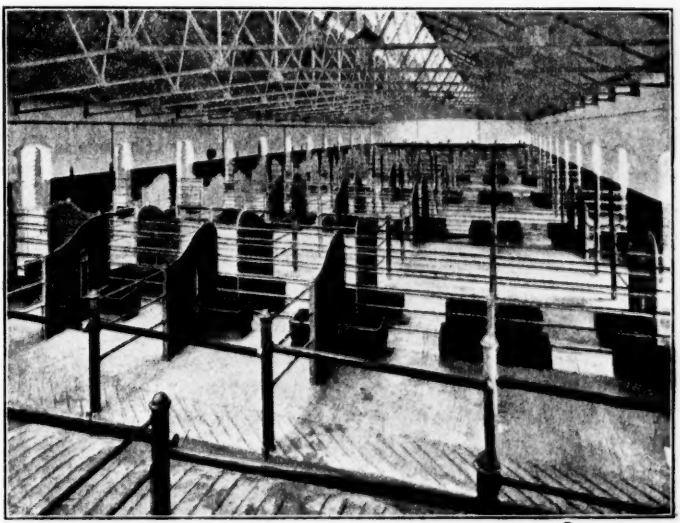
The cattle divisions are of cast iron and are spaced at a sufficient distance apart to accommodate two animals. Each stall is fitted with two glazed fireclay drinking troughs, which can be supplied with water from flexible hose in the feeding passages, towards which the beasts stand head to head.

The cattle slaughter hall has been designed somewhat on the lines suggested in the report of the Admiralty Committee on the Humane Slaughtering of Animals, in order to combine as far as possible the advantages of the separate and open hall systems, to overcome the objections to both and to economize space.

The open hall is ideal for inspection and cleanliness, but from the point of view of humanity cannot compare with small separate slaughter rooms where beasts can be killed and dressed one at a time, and the room cleaned down after each killing.

The slaughter hall is 220 ft. long by 40 ft. wide, and is separated from the lairage by an open passage 15 ft. wide. Inside the hall abutting upon the passage there is a range of twenty slaughter pens with doors opening on the passage opposite the doors of the lairage so that cattle can easily be roped across. The pens, which are 10 ft. 6 in. wide by 14 ft. long, have division walls of glazed brick 6 ft. high, with door openings 5 ft. wide communicating with the common hall. With this arrangement

Main Entrance to the New Municipal Abattoir.



Cattle Lairage.

each beast can be killed and bled separately in an enclosed pen, transported to the open hall, and dressed under proper supervision and inspection, and the pens can be thoroughly swilled down after each killing.

Owing to the necessity for transporting carcases from pens to the dressing hall extra labour is involved, but by the introduction of electric lifting and transporting hoists all disadvantages of the system have been overcome.

The average time required for killing and dressing a beast is about three-quarters of an hour, that is to say, fifteen minutes in the pen for killing, bleeding, &c., and thirty minutes in the open hall for dressing and making ready for removal to the hanging hall. As each beast killed in the pen has to be transported to the dressing hall, and as the time required for dressing is twice that of killing and bleeding, one transporting hoist and two dressing hoists have been provided in the dressing hall opposite each pen.

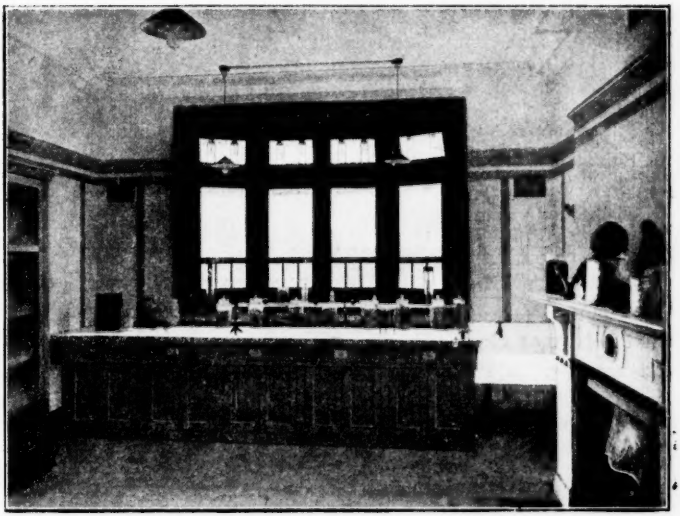
When a beast has been killed and bled it is transported to the dressing hall, to the necessary position under either of the lifting hoists which may happen to be vacant, and from that point the dressing is proceeded with in the ordinary way. The carcases when completed are transported to the hanging hall over a system of twin bar runways connected therewith. The possible rate of killing and dressing at a conservative estimate will be 80 beasts per hour.

The cooling or hanging hall is 166 ft. long by 48 ft. wide, and is separated from the dressing hall by a covered passage, 15 ft. wide, in which the gut cleaning tables are located. The hanging hall is completely fitted up with twin bar runways, and will accommodate 544 carcases.

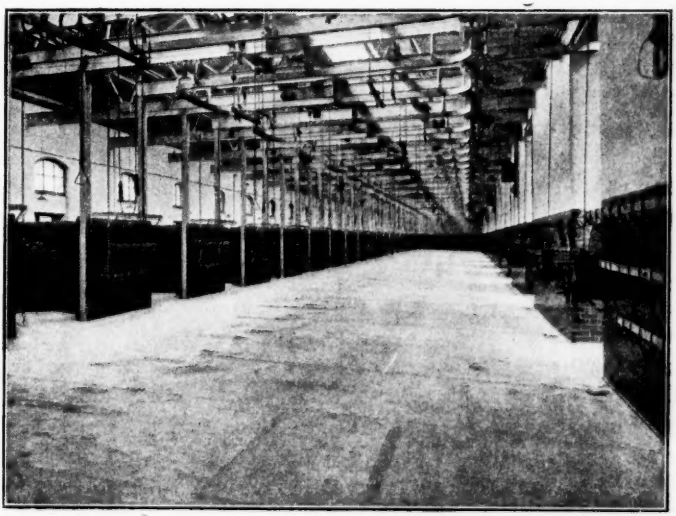
When the carcases are sufficiently cooled they can be transported along the runways and stored in chill rooms, or lowered into butchers' carts under a verandah abutting upon the main roadway through the abattoir.

In connection with the cattle department there are two isolated stalls for animals suspected of disease, a separate slaughter room and hanging room for suspected meat, and a condemned meat room containing a digester for dealing with meat unfit for food.

In the sheep department there is a separate building for sheep



Veterinarian's Laboratory.



Cattle Slaughter Hall.

lairage which will accommodate 850 sheep, a sheep slaughter hall containing thirty-six killing stools, with six adjacent pens for sheep to be immediately killed, and a sheep hanging hall fitted with hanging rails, and hooks to accommodate 700 carcases.

The sheep slaughter and hanging halls are separated by a 16-ft. covered passage, which is intended to be used for the removal of fleeces, offal, and manure, and as it has been provided with rails and hooks it can also be used for the slaughter of calves or sheep if occasion requires.

In the pig department there is a lairage with accommodation for 200 pigs, a slaughter hall with four stunning pens, four scalding tanks, and four scutching tables, and a hanging hall which will accommodate 250 carcases. The floors of the lairage and stunning pens are raised to the level of the tops of the scalding tanks so that pigs after killing can be transferred to the tanks without lifting tackle. The slaughter hall and hanging room are provided with a complete system of twin bar runways over which the carcases of the pigs, after scraping, can be transported to the dressing hooks in the slaughter hall, or to the hanging hall by trolleys with quick rope hoists attached.

To make the operation of killing as cleanly as possible a stomach cleaning department has been provided adjacent to, and in direct communication with, the tripery. The department contains two floors, the ground floor being a stand for carts or trucks to remove the manure, which will be discharged through a chute from the upper floor where the stomachs will be slit and cleaned. The upper floor is provided with a cleaning bench over the chute and with cold water washing tanks, and the stomachs after cleaning and cold washing will be delivered direct to the receiving tables in the tripery by inclined galvanized iron chutes. The tripery has been constructed in duplicate so that it can be let to two separate firms; it is completely fitted up with scraping tables, galvanized iron cold and hot water tanks, tripe boilers, glazed fireclay storage tanks, hooks, and draining shelves and discharge counters so that the stomachs, &c., received at one end can be discharged after preparation at the other.

Separate rooms have been set apart for the extraction and drying of serum from the blood, and for the preparation and dressing of guts, each being provided with the apparatus and appliances necessary to its trade.

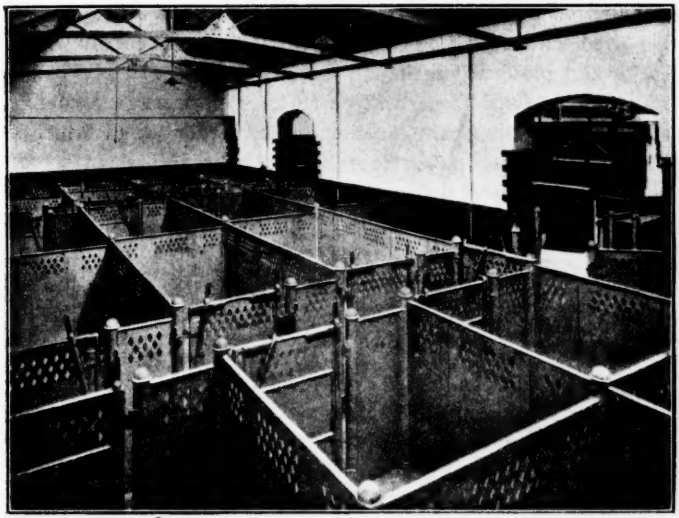
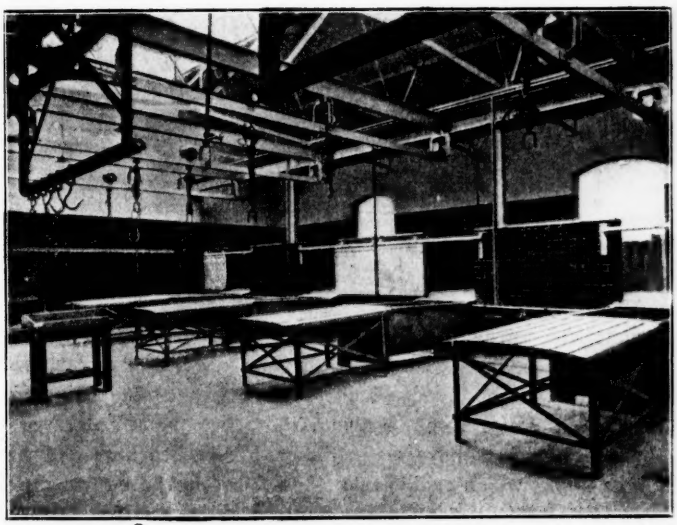


Fig Lairage.



Pig Slaughter Hall.

The chill rooms, which are being constructed on the abattoir site in a central position relative to the various departments, will be fitted with twin bar runways (in direct connection with the cattle and pig hanging halls), and with sheep and pig hanging rails and hooks. There will be an internal passage forming an airlock and four separate chambers, either or all of which can be used for chilling or cold storage. It is at present intended to use one of the chambers for general produce, and the remaining three chambers for abattoir purposes, which would provide accommodation for about 15 per cent. of the total capacity of the hanging halls for cattle, sheep, and pigs.

Machinery and Equipment.

The dressing hall is equipped with sixty hoists, forty electrically driven and specially designed, and twenty hand-operated. The electric hoists are of the worm gear type built up in pairs, one for hauling out and one for dressing; they are driven by electric motors through line shafting in series of eight, and are so arranged that current will only be used when one (or more) hoist in each series is actually working. The electric control switches, which have been specially designed, are connected with the clutch fork levers of the hoists so that the starting of any hoist is performed by one operation. The clutch forks are held in position during the time the hoists are lifting and are pulled out by springs immediately the handles are released, so that no machinery will be in motion unless one (or more) clutch is being held in. Lowering is effected by releasing band brakes normally kept in position by springs, and the control levers must be held down during the whole time of lowering as the springs put the brakes on immediately the lowering handles are released.

The cambrils are of the double-rope type, so designed that when the carcases carried are split down the back the two sides automatically gravitate to a central position ready for transference to the runway. The runway is very substantially constructed and of the twin-bar type, which requires no movable points, and there are, therefore, no movable parts to get out of order.

The runway trolleys are fitted with ball bearings and have double hooks which enable two sides of a beast to be transferred from hoist to trolley at one operation.

The whole of the drainage from the cattle dressing hall will

pass through a specially designed fat screen which will automatically remove the particles of fat and deposit them in a receptacle provided for the purpose. The screen is of 1/16 in. mesh wire gauze in the form of an endless belt, placed at an angle of 30° to the horizontal. The screen is driven by a motor, and the particles of fat arrested and carried up on the screen will be automatically swept by a rotary brush into a portable receptacle.

Two Lancashire boilers have been installed to provide steam for the hot-water supply for the piggery scalding tanks, and for power purposes. Hot water is generated in a Royle's Calorifier placed in the boiler house, and is conveyed to various points in the cattle, sheep, and pig slaughter halls and tripery, by a system of circulating pipes.

The refrigerating plant consists of a steam-driven ammonia compressor and double pipe ammonia condenser located in the engine house, and the cold storage rooms are cooled by circulating air with a motor fan through a cooling battery of galvanized plates cooled by brine, which, together with the brine cooler, will be placed in a cold storage building.

The digester for condemned meat will be fed by steam from the boilers, and the necessary vacuum created by a water ejector fed from the public supply. The digester will not only render the condemned meat completely sterile, but will enable the fat to be separated, and leave the flesh and bone in a condition suitable for manure.

The whole of the buildings, roads, and passages are lighted by electricity, and the current required both for lighting and power is taken from the public supply through a main switchboard located in the engine house.

The total cost of the abattoir and equipment has amounted to £52,000.

Meat Inspection.

Every arrangement which experience and inquiry could suggest as necessary or desirable for the protection of the health of the consumers of meat has been adopted, in order that, so far as it is possible to do so, all meat sent out from the abattoir will be sound and fit for human consumption. The responsibility for the efficient inspection of all animals killed, and meat sent out for public consumption, is entrusted to the City Veterinarian,

Mr. J. A. Jordan, M.R.C.V.S., who is assisted by five experienced inspectors.

Three of these inspectors are constantly on duty during the working hours of the abattoir, and inspect every carcase and organ immediately the animal is slaughtered. If the inspectors detect any abnormalities, they at once apprise the Veterinarian, who subjects the carcase to a more thorough examination in order to determine if the disease present is of such a nature or extent as to warrant him in seizing the whole carcase, or whether it might be possible for him to pass it after removal of the diseased parts.

In deciding as to the fitness or otherwise of the flesh of tuberculous animals, generally speaking the recommendations of the Royal Commission on Tuberculosis in 1898 are taken as a basis. Any deviation from this is determined according to the degree of extension, stage, and intensity of the pathological process, and according to the general nutritive condition of the carcase.

All carcases and organs that have been seized are immediately removed to a store set aside for the purpose, where they are kept for a reasonable time in order to give the owner an opportunity, if he desires, of having another expert's opinion. They are then taken before the Justices of the Peace, under surveillance of one of the meat inspectors, who, in accordance with Sections 132 and 133 of the Public Health (Ireland) Act, 1878, applies for an order for their destruction. When this Order has been granted, the condemned carcases and organs are conveyed back to the abattoir, where the most up-to-date plant—known as "Scott's Patent Vacuum Destructive Digester"—has been installed for the treatment of condemned meat.

The operation of destruction is carried out in a thoroughly sanitary manner, and it is hoped that valuable commercial by-products will be the result, so that butchers using the abattoir may receive a fair return from the residue of their confiscated carcases.

Meat Inspection Depot.

By Act of Parliament (1899) power was granted to establish a depot for the purpose of inspecting all meat prepared outside the city boundaries before being exposed in the city. This establishment is in the Grain Market, which has an opening from

both Chichester Street and May Street. It is opposite the Police Courts, so that when it is necessary for the magistrates to view meat which has been seized prior to granting the order for its destruction, little of their time is occupied in doing so. It is open daily (Sundays excepted) from 8 to 10 a.m., during which hours an inspector is in constant attendance. Mr. Jordan himself attends every morning about 10 o'clock. Overhead rails, with pulley blocks and chains attached, are arranged in this building, so as to facilitate the easy handling of carcases.

For the purposes of inspecting pork which has been prepared outside the city boundaries one of the inspectors is in attendance daily at the pork market from 8 a.m., and inspects all pork exposed for sale therein. If, on inspection, he finds lesions of tuberculosis or other disease he at once informs Mr. Jordan, who attends and decides as to its fitness for human food or otherwise.

Daily visits are paid to the butchers' shops, pork shops, and stores in the city. Last year, 4,940 visits were made, when all meat exposed for sale was carefully inspected, with the object of detecting any signs of decomposition.

Railway stations, hide marts, cold storage, fish and fruit markets also received due attention, daily visits being made to them.

Meat Stamping.

The Chairman of the Markets Committee (Dr. Henry O'Neill) has always taken a keen and lively interest in matters pertaining to the health of the people, and he has for many years advocated the stamping of every carcase and organ intended and passed as fit for human food, and he is of opinion that until the public demand this they will have no guarantee that the meat they purchase has been inspected and passed as sound, or that they are being served with the quality asked for.

Being personally acquainted with the butchers' objections to these indelible ink rubber dies, the City Veterinarian (Mr. Jordan) has invented and patented an electric device which certainly should facilitate the operation of branding or stamping meat. It is portable, makes a clean, absolutely indelible, and unobjectionable mark upon the meat, and can be made instantly ready for use.

It consists of a portable stamp or brand holder, upon the face of which any desired metallic or other stamp or brand may be removably secured; between this stamp and the holder resistance

coils are suitably arranged above a portable plate affixed to the holder, the coils being suitably insulated. When an electric current is passed through the coils, heat is generated, and the brand being subjected to this heat the temperature is raised to such a degree that on placing it against the meat a corresponding mark or brand is obtained thereon.

HOME MEAT STAMP.

Fig. 1.

Indelible Ink Rubber Stamp used by the Meat Inspectors of the "County Borough of Belfast" for carcases slaughtered within the Public Abattoir after the meat has been examined and found healthy and fit for human food.

FOREIGN MEAT STAMP.

Fig. 2

Indelible Ink Rubber Stamp used by the Meat Inspectors of the "County Borough of Belfast" for carcases slaughtered outside the Borough Boundary of Belfast, and brought for inspection to the Meat Inspection Depot.

The supply of electricity may be obtained from any suitable source, such as a portable battery, or by means of a flexible connection from a public supply.

In order to promote humane methods in the slaughtering of animals intended for human food the Markets Committee are providing a number of Ransom's Patent Air Killers. This new killer is not a firearm, but it is worked by compressed air, consequently safe in the hands of the most inexperienced.

REPORT ON SOME OBSERVATIONS MADE AND WORK DONE AT THE PASTEUR INSTITUTE, TUNIS.*

By Captain A. C. H. GRAY.

Royal Army Medical Corps.

The town of Tunis, the capital of Tunisia, is easily reached from Marseilles by the "Transatlantique" line of steamers. Passenger steamers leave Marseilles harbour every Monday and Wednesday at midday. The journey lasts thirty-two hours.

The Pasteur Institute of Tunis is situated at the northern extremity of the town, opposite the Belvedere Gardens. A tram from the centre of the town takes one to the door of the Institute, the journey taking a quarter of an hour.

The principal building contains a large general laboratory for the preparation of culture media, &c., separate laboratories for the director and his staff, hot and cold incubating-rooms, a waiting-room, and an inoculating-room for those attending for anti-rabic inoculation, and also a large library. In the basement of the building are laboratories for the preparation of the anti-rabic injections, and a warm room in which the spinal cords are dried.

A large single-storied annexe contains a laboratory for the preparation of calf lymph and stabling for the calves. In this building are housed all the experimental animals, chimpanzees, monkeys, dogs, rabbits, and guinea-pigs; it stands in the grounds of the Institute some fifty yards away from the principal building.

As the Institute is situated more than a mile and a half from the centre of the town, a bureau has been established in the town, to which the public can bring products for analysis, &c., and where serums and vaccines made at the Institute can be bought.

The principal departments of the Institute are:—

(1) For the preventive treatment of rabies.

(2) For the preparation and distribution of calf lymph. About 50,000 doses are distributed every year, and, in addition, any person who wishes it can be vaccinated at the Institute free of charge.

(3) For the chemical analysis and microscopical examination of products and pathological material.

(4) The fermentation department for the distribution of selected yeasts.

---

* Abstracted by permission of the Editor of the *Journal of the Royal Army Medical Corps.*

Other vaccines, such as tuberculin, mallein, and symptomatic anthrax vaccine, not made at the Institute, are distributed to the public. Medical leaflets on the local diseases are written and distributed broadcast.

In addition to all the routine work of the Institute, the Director, Dr. Ch. Nicolie, and his assistants, find time for research work on a large scale, and it is this work which has given the Institute its world-wide reputation.

It would be difficult for me to exaggerate the kindness with which I was received at the Institute. A special laboratory was put at my entire disposal, an attendant was told off to help me in the *post-mortem* examination of the dogs. Everybody, from the Director downwards, went out of his way to show and explain things to me, and it was with feelings of genuine regret that I said good-bye when my two months were over.

Preventive Treatment of Rabies.

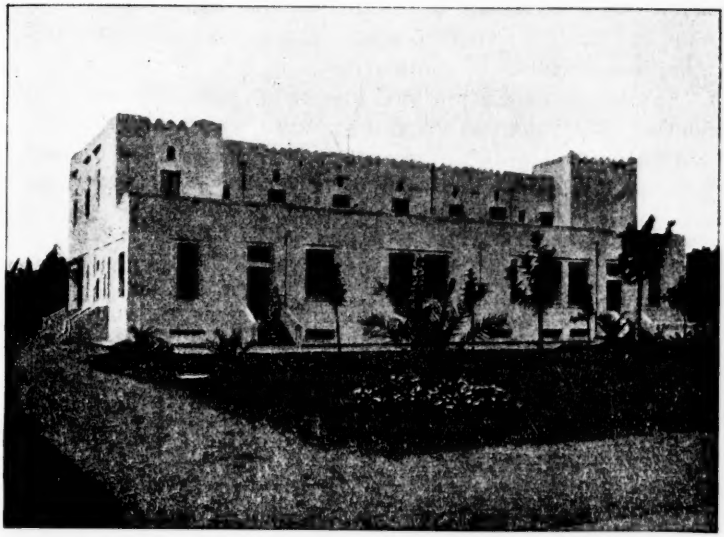
The preventive treatment of rabies was of great interest to me, as I had never seen anything of the kind before. This is really the main work of the Institute, and the whole of the basement of the building is given up to it. Through the kindness of the Director I was allowed, after learning the methods, to perform autopsies and prepare the injections myself.

Calmette's modification of Pasteur's original method, *i.e.*, the use of glycerinated spinal cord, is the one used.

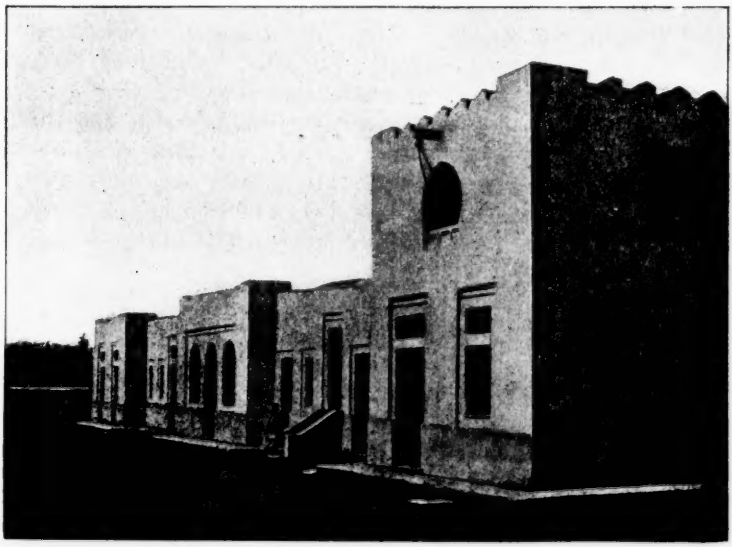
Rabies is still of frequent occurrence among the dogs of Tunis. Preventive treatment was started on January 1, 1905, and more than two thousand patients were treated at the Institute in the first year. All stray dogs in Tunis are captured and destroyed, the local police being very vigilant in this respect. All dogs without collars are caught and taken to the municipal fourrière. If not claimed by their owners within a week they are destroyed in a lethal chamber with coal gas. In this way about a thousand stray dogs are got rid of every year.

The rabbits used for inoculation are specially selected for their large size, and are kept under observation for a month to ensure that they are in good health. Three or four rabbits are inoculated at a time. The inoculated rabbits die of rabies on the eighth day.

The bottles containing the pieces of cord are kept in an ice-chest. The cord is kept for at least ten days in the glycerine



Pasteur Institute, Tunis (from the Grounds).



Pasteur Institute, Tunis. Annexe.

before being used, and will retain its full potency for several months. Enough material is always kept at the Institute to treat a hundred patients.

The injections are prepared just before use. A list of the number of injections of the first (or fixed virus), second, third, and fourth day cords is made out each morning. The weakest injection is prepared first. The right number of pieces of cord are removed from the bottle with sterile forceps and are put into a sterile glass measure, the bottom of which is of ground glass. The cord is then mashed up with a sterile glass rod. After a thorough mashing sterile saline is added, a few drops at a time. When thoroughly emulsified, the total bulk of fluid is added, allowing 5 c.c. of saline for each injection, so that if enough cord for twenty people had been taken from the bottle, the emulsion would be made up to a bulk of 100 c.c. Each strength of spinal cord is emulsified in this way.

The patients attend at the Institute for their injections at 8.30 in the morning. First come those who are to have the mildest injections (*i.e.*, fourth day cord). A 10 c.c. glass syringe, fitted with an expanding rubber piston, is used. The needle is of steel, short and rather stout, and is kept very sharp. The syringe is sterilized, before use, by boiling. The emulsion is drawn up into the syringe to the 5 c.c. mark. The patient's flank is exposed, and a dab of iodine is applied with a wooden piston.

The needle is inserted through the dab of iodine and the injection given subcutaneously. The needle is then withdrawn and a fragment of cotton-wool pressed over the spot. The syringe is sterilized once for each series of injections. Between each injection the needle is dipped into a pot of boiling boracic solution.

Two methods of dosage are used at the Institute: (1) Ordinary; (2) intensive.

In both systems one dose only is given daily. The amount of cord given is always the same. The injection is always of 5 c.c. bulk.

Twenty-five injections are given in thirty-three days. The intensive treatment is used for: Bites on the face; deep and penetrating bites; and for those cases in which treatment has been delayed. In all other cases the ordinary treatment is used.

Canine Leishmaniasis.—Soon after my arrival at the Institute, Dr. Nicolle suggested that I should carry out a further examina-

tion of the dogs in Tunis just as he had done in 1908, and the Yakimoffs in 1911. Nicolle examined his dogs during the months, March, April and May. The Yakimoffs examined theirs between January and May. Both these investigators found a very similar percentage of infected dogs, the former 1·8 per cent., the latter 1·6 per cent. at Algiers. The brothers Sergent, during the months of July, August, and September, had found as many as 7·2 per cent. of the dogs to be infected. This great difference in the percentage of infected dogs in two towns, not so far apart, where the conditions of life seemed identical, might be explained by the fact that in Algiers the dogs were examined in the summer months, in Tunis much earlier in the year. I was to examine the dogs in Tunis during October and November; if my figures agreed with what had already been found in Tunis, then some other factor than the season must be responsible for the large number of infected dogs in Algiers.

From figures already published which I have put in tabular form, it is evident that there is a very great difference in the number of infected dogs found at various places on the shores of the Mediterranean.

Place	Dogs examined	Number infected with *Leishmania*	Percentage
Tunis, 1908	222	4	1·8
Tunis Suburbs	5	0	—
Gafsa	21	0	—
Sfax	5	0	—
Tunis, 1911	299	5	1·6
Algiers	125	9	7·2
Bordanaro (Messina)	33	27	81·8
Rome	60	16	26·6
(Lisbon)	300	8	2·6
Malta	83	7	8·4
Athens	184	15	8·1
Piræus	40	3	7·5
Catania	275	3	1·09
Palermo	227	0	—

I examined dogs in Tunis between October 16 and December 5, as follows:—

Date	Number of dogs	Date	Number of dogs
October 16	13	November 13	9
,, 17	3	,, 15	2
,, 21	2	,, 19	3
,, 23	19	,, 20	7
,, 30	15	,, 21	10
November 2	1	,, 25	3
,, 4	2	,, 27	5
,, 6	20	,, 28	2
,, 8	1	December 2	1
,, 9	2	,, 5	7
	78		49
			78
		Total	127

Out of these 127 dogs I found two infected with Leishmania, that is to say, 1·6 per cent., an exactly similar result to that obtained by the Yakimoffs in 1911.

The first infected dog found was the forty-eighth examined; the examination was made on October 30, 1912. The second infected dog was the ninety-ninth examined; the examination was made on November 20, 1912.

Dog 48. *October* 30, 1912.—Brought in eighteen hours after death. A full grown black and white dog. Neither emaciated nor obviously anæmic. Its coat was in good condition, there was no loss of hair. *Lungs* and *heart* normal. The *spleen* was considerably enlarged, being about twice as large as the normal for the size of dog. It was pale and rather granular-looking; its consistence was normal. *Liver* normal. *Bone-marrow* of a bright red colour all through the bone. *Kidneys* were pale, but not otherwise abnormal. Numerous Leishmania parasites were found in the bone-marrow of this dog; in the spleen smears parasites were rare; in a smear from the liver, one parasite was found after a prolonged search.

Tubes of N.N.N. medium were inoculated from the bone-marrow of this dog, and a good growth of typical flagellated parasites resulted. In addition, two dogs were inoculated intra-peritoneally with 4 c.c. and 3 c.c. respectively of a thick emulsion of spleen pulp in physiological saline solution. These two dogs were in good health when I left the Institute on December 13.

Dog No. 99. *November* 20, 1912.—Brought in twenty hours after death. A small emaciated black puppy; several patches quite bare of hair were present on the body, one of which was as big as the palm of the hand. *Eyes* were normal. The animal was very anæmic. *Heart* and *lungs* normal. *Spleen* was not obviously enlarged; it was pale and soft. *Liver* was pale, not enlarged. *Bone-marrow* uniformly red and very liquid. *Kidneys* were pale. Smears from the various organs showed that this dog had suffered from a very intense infection. In the bone-marrow the parasites were the most numerous. In the spleen and liver smears parasites were seen in large numbers. In a film of blood taken from the portal vein parasites were numerous.

Two monkeys and two dogs were inoculated with spleen pulp from this dog, and so far as I know these animals are still in good health. Tubes of culture medium were also inoculated, but these were contaminated.

As was pointed out by Basile, and again by the two Yakimoffs, it seems that canine Leishmaniasis may exist in two forms: An acute form, from which Dog 99 suffered, which attacks puppies and kills them in three to five months; in this form parasites are very numerous in the internal organs and even in the blood-stream, but splenic enlargement is not pronounced. A chronic form, Dog 48, in which the animal does not appear to be ill, and the disease is only discovered by *post-mortem* examination; in this form parasites do not appear to be numerous, but there is considerable enlargement of the spleen.

The cultural forms of *Leishmania canis* have been so often and so accurately described by Nicolle, Basile, the Yakimoffs, and other observers that a further description would serve no useful purpose.

Equine Clinicals.

A COMPLICATED CASE.

By A. R. ROUTLEDGE, F.R.C.V.S.
Louth, Lincs.

Subject.—A well-bred yearling Shire colt in good condition. Admitted to infirmary September 13, 1912. A true right abdominal testicle removed, weight 2 oz., the left being in the scrotum, weight 9 oz.; both by Dewar's ecraseur. Seen to be comfortable at midnight.

September 14, 6 a.m.—Lost a quantity of blood during the night from the left side, a clot hanging from the scrotal wound continued to drip till 9 a.m.; pulse 100, temperature 102° F., slightly uneasy, blowing, sobbing, partial erections. Gave a feed and drink of chilled water at 3 p.m.; arterial blood immediately commenced from the left side, it soon stopped. 6 p.m.: pulse 84; temperature 102° F.; has staled twice; no action of bowels; easier appetite; straw coloured serum dropping from left side.

September 15.—Pulse 106; temperature 104° F.; respiration 60; blowing and sweating; appetite *nil;* drank half a bucketful of sloppy bran and immediately commenced to bleed from near side; clot removed, the scrotum being packed with wool saturated in strong solution of alum and sutured up; continued to bleed at intervals all day through the stitches. At 4 p.m. venous blood commenced to ooze from the right operation wound. 10 p.m.: pulse 126; temperature 104·6° F.; respiration 46; eagerly drank oatmeal gruel, nibbling clover, &c.; penis is pendulous, remaining so permanently.

September 16.—Pulse 112; temperature 103·6° F.; general improvement; dark coloured serum from right-side operation wound; penis suspended all day.

September 17.—Pulse 99; temperature 104° F.; blowing uneasy; not cleared up; dressed right operation wound; symptoms of laminitis; removed front shoes; poulticed feet; slight improvement towards night.

September 19.—Pulse 80; temperature 103·6° F.; respiration 22; sheath considerably swollen; fair amount of pus from the operation wound.

September 26.—Pulse 70; temperature 101·4° F.; walked to field very weak; would not graze; very dull all day, but seemed brighter at night.

September 28.—Pulse 65; temperature 101·2° F.; refused breakfast; at 10 a.m. passed a very sloppy offensive motion; gradually increasing symptoms of gastric disturbance presented; eructating gas; sweating profusely; easier about 7 p.m.

During the time he was in pain the penis became almost normal, only to afterwards become as bad as ever. Gradual improvement. Colt sent home October 14. Wounds healed up, but the penis absolutely pendulous.

May 27, 1913.—Admitted to infirmary, cast and chloroformed, and amputated the penis by elastic ligature. For a full account of operation, see p. 61 of Cadiot and Dollar's "Clinical Medicine and Surgery." A brief description of method of operation: Penis drawn well forward and tourniquet applied to its base; metal catheter passed. A triangle of skin and subcutaneous tissue dissected out down to the urethra. The urethra is then divided transversely on to the metal catheter. Then, longitudinally the flaps reflected and sutured with fine silk to the edges of skin in the form of a triangle. Several turns of a tightly stretched rubber cord applied round the penis, the paralysed portion removed with a bistoury.

During the next three days passed arterial blood from the stump and urethral incision after urinating. The stump end and ligature came off on June 6, the sheath being swollen to half the size of a football. Turned out to grass on June 7. On June 15 badly colicked in field; sweating and crouching; no urinary obstruction; remains on ground a lot with forelegs out as though in the act of rising. Gradually recovered and sent home on June 23.

Owner wires, July 16, colt unable to stale. My locum, Mr. H. Hicks, M.R.C.V.S., visited and found penis end healed up to a straight line; the urethral opening about the size of the lead of a pencil. The horse was cast and the end laid open.

Sent to infirmary August 23 as bad as ever. Cast, cocaine injected and the cicatricial tissue divided. The urethra dilated with a pair of forceps and a silver catheter, 5 in. long, $\frac{5}{8}$ in. diameter, with two rings at the external end inserted into urethra and kept in position by deeply placed sutures into penis stump.

Pressure from behind tended to push the urethral tube out and make the sutures cut. They were renewed (standing) about once a fortnight and the tube kept in till September 15 a bone bougie being passed daily till September 30, on which date the colt went home, the owner being instructed to pass the bougie twice a week.

I examined him at the end of January of this year. The urethral orifice readily admitted my first finger. The colt urinates freely and is apparently quite cured.

CLINICAL NOTE ON TWO CASES OF SPAVIN WITH LARGE EXOSTOSIS, TREATED BY DIVISION OF THE CUNEAN TENDON OF THE FLEXOR METATARSI.

By Captain PERCY ARGYLE, F.R.C.V.S., A.V.C.

Cavalry School, Netheravon.

Case 1.—Subject: Bay mare, "Polka," aged 7. This was a well-bred animal, and had been used as a demonstration horse for show jumping. On September 2, 1912, she was brought in lame on the near hind leg, and on examination was found to be suffering from spavin. There was a distinct bony enlargement of the inner aspect of the hock, the toe of the shoe was worn, and there was a bruise of the horn around the toe. The mare was sent to the Station Veterinary Hospital, Bulford, and was there treated by five pyro punctures with the ether cautery. After ninety-four days on the sick list she was discharged to light duty, relieved on January 4, 1913.

In about three weeks she began to go very lame again, and there was a large, diffuse bony enlargement all over the inside of the hock. She walked lame, and could hardly put the foot to the ground. After a conference with the veterinary officers at Bulford it was decided to perform cunean tenotomy.

The heels of the shoe were considerably thickened and the mare sent to hospital. On February 26, 1913, she was cast, chloroformed, and the inside of the hock washed with ether soap, shaved, and painted with tincture of iodine. I made an incision about an inch in front of the chestnut, obliquely downwards and forwards. The skin was closely adherent to the subcutaneous tissues, especially at the points where the cautery had penetrated,

and the tendon was with difficulty identified and isolated. One puncture had penetrated it.

After freeing it as far as possible it was raised from its bed on a blunt tenaculum and divided, but I did not remove any of it. I closed the wound with two silk stitches, and the mare was allowed to rise. She was kept on the pillar chains that night, and the following day was led out for half an hour's walking. This was repeated each day and the stitches held. At the end of a week the wound was practically healed and the stitches were removed.

After a fortnight the mare was trotted and went almost sound, and she was discharged from hospital to light duty on April 27 after twenty-nine days.

She remained at light work for a fortnight, and was then put to her regular duty. She remained quite sound until May 8, when she was transferred for issue as a charger.

Case 2.—Subject: Bay gelding, aged 4, "Derelict." Joined the cavalry school on April 3, 1913, commenced training, and was doing very well.

After three months the animal became very lame on the near hind leg—so lame that it went on three legs at times. There was a diffuse exostosis over the inside of the hock, hot and painful to pressure. As in the preceding case, the toe of the shoe was worn and the horn of the toe was bruised. There was a scar on the inside of the hock which appeared to have been caused by previous treatment, so I decided to try the operation again.

The heels of the shoe were thickened, and the same procedure was adopted as before. On dividing the skin I could find no traces of puncture, but there was a good deal of inflammatory thickening of the subcutis. After isolating and dividing the tendon I closed the wound with two silk stitches. These stitches did not hold, as the scar tissue was very thick.

The horse was put to walking exercise next day, and this was continued daily. His action improved every day, and after thirty-eight days—on August 1—the horse trotted quite sound. The animal was discharged to duty on the 12th, the wound having completely healed. The patient has done its work quite satisfactorily until the present time.

FIBRINOUS PERICARDITIS AFTER STRANGLES.

By Chief Staff Veterinary-Surgeon HOSE.

On August 6, 1913, a remount fell ill with a bad attack of strangles. At first the animal showed symptoms of angina, also its general condition was considerably disturbed and the taking of food much hindered. The number of rather strong pulse-beats was 50; the respirations 16; the breathing gasping and laboured. Rectal temperature 40·1 C. Patient received a sharp rubbing round the larynx. In the course of the next day the breathing was free and the patient showed good appetite. On August 9 both submaxillary glands and the parotids swelled and suppurated after a short time. On August 15 the patient seemed quite lively, had a very good appetite, and was put in the convalescent stable.

On August 26 the patient seemed less lively and only moved about unwillingly; he was brought into a box in the sick stable. Examination showed a weak pulse, 60 per minute; respirations 14; and rectal temperature 39·0 C. Appetite was small; movements avoided as much as possible. Patient received three times daily 10·0 grm. of oil of camphor, and once daily 10 grm. of potassium iodide. The condition of the horse got gradually worse. Clinical examination always showed a weak action of the heart; the heart-sounds were weak and not plainly audible, but the diagnosis was negative. Treatment as before.

On August 31 a friction sound was heard in auscultation which synchronized with the heart's action. In spite of increased camphor oil injections the heart weakness always increased. On September 3 the patient got down and could not be raised. The number of the pulse was no longer countable. Through increasing weakness the patient died on September 4 at four o'clock in the morning without any death struggle. *Post-mortem* was made five hours afterwards.

Autopsy.—The cadaver very moderately nourished; the visible mucosæ cyanotic; the natural openings of the body closed. Nothing unnatural in the abdominal cavity; situation and appearance of intestinal canal normal. Liver, spleen, kidneys and mesenteric glands somewhat enlarged and not so firm as normal. The peritoneum is smooth, glistening and transparent.

On opening the thoracic cavity the heart with the pericardium seemed about 45 cm. higher and 38 to 40 cm. broader at the base, a bluish-grey shimmering sac that was apparently chock-full of

fluid. In the pericardial sac there was about 10 litres of amber-coloured turbid fluid in which large clots of fibrin floated. Pericardium and epicardium are covered with a 5 mm. thick, hard-to-remove fibrin layer, which was rough and dark red. At the right side of the apex of the heart these fibrin masses were coloured dirty brownish red. The heart was compressed and small; its muscular tissue firm and reddish grey. The valvular apparatus showed no changes. The pleuræ were injected throughout, but smooth and glistening. Both lungs contained air and through compression of the enlarged heart showed atelectic areas. On the external surface of both lungs there was rib pressure, but no indication of previous lung. *Post-mortem* of the head and neck was negative.

Death resulted from paralysis of the heart.

Diagnosis.—Hydrops pericardii, fibropurulent inflammation of the peri- and epicardium, atelectasis of single sections of lung.—*Zeitschrift für Veterinärkunde.*

Canine Clinicals.

COMPLETE REMOVAL OF THE PREGNANT UTERUS AND OVARIES IN A BITCH.

By J. LEGG, B.V.Sc., and H. R. SEDDON, B.V.Sc.
Veterinary School, Melbourne University.

Subject.—Yorkshire terrier bitch, aged 1 year 9 months, weight 5 lb.

History.—At 10 months old she was first put to the dog, and at the time of parturition she experienced a difficult labour and gave birth to one dead pup. The owner two months ago decided to again put her to the dog, but in view of the previous difficulty he mated her with a small stud dog, "Little Bonzer" (weight 4½ lb.).

The period of pregnancy was normal, and up to the time of parturition the animal was perfectly healthy. She gave birth to the first pup at 7 p.m. on November 18; this pup was dead. The animal soon afterwards appeared to be in trouble; she commenced to show uneasiness, moving about in the box whining, but no

more pups were born. She was brought to the hospital at 3 p.m. on November 19. Examination discovered a pup, which was alive, in the normal position, so it was decided to leave her for an hour or two. At 8 p.m. traction was applied to the pup inside, but found to be useless, and it was then decided to operate as the pup was apparently of considerable size and the bitch was greatly valued as a pet; 1 gr. of morphine was given and the animal anæsthetized with ether.

Operation.—The animal was secured on her back, and after preparation of the skin an incision was made in the median line so as to avoid the enlarged mammary glands. The abdominal cavity was opened and it was found that the uterus near the os was very congested. As the bitch was very weak and duration of operation a consideration it was decided that it would be better to do a complete hysterectomy than to attempt Cæsarean section. Ligatures were applied to the ovarian ligament and the uterine arteries, and a ligature was being applied to the uterus when the animal collapsed. Artificial respiration was applied and in about a minute she came round. The operation was proceeded with as rapidly as possible, but artificial respiration had to be continued at intervals and inhalations of ammonia given. The ovaries and uterus were removed and the abdominal wound closed.

The bitch recovered well from the anæsthetic and was put in a warm box after being bandaged. Next day she took little nourishment, but thereafter gained rapidly in appetite and strength. The wound healed quickly, and the patient was discharged fourteen days after the operation.

The pup was dead when removed from the uterus and was much too large to have been expelled by the normal passage.

FOREIGN BODIES IN THE STOMACH OF A DOG.

By Professor COQUOT.

It is a common thing to hear of foreign bodies in the stomach of a dog. Their form, size and weight are very variable. Some, on account of their dimensions, cannot pass through the pyloric orifice and remain in the gastric receptacle, which tolerates them easily for months (or even years, as M. Nieder has recorded); others are ejected by vomiting, or else they slowly pass along

through the intestines to be expelled with the excreta. In other cases intestinal obstruction may be caused and a surgical operation may be necessitated.

When the diagnosis is prompt a cure can be assured by the simple incision of the intestine (enterotomy), but if treatment has been delayed, and if the intestine has become gangrened, friable or perforated, it will be necessary to excise the affected parts (by the operation of enterectomy completed by entero-anastomosis).

The shape of the object and its weight, rather than its size, are the factors which make expulsion by vomiting easy or difficult; a round or oval pebble is more easily ejected than a flat thing of the same diameter, such as a coin; in the case of the former the dilatation of the œsophageal opening of the stomach and of the œsophagus itself is circular and progressive, and it is helped by the weight of the object and by the hanging position of the head. It is sometimes surprising to see how easily small dogs swallow large objects, which are brought up again just as easily. This is due to the elasticity of the œsophagus and to the remarkable adaptability of the cardia.

The following is a very typical example: —

"Pick," a fox terrier, 7 years old, was taken out for a walk by his master's clerk, who amused himself by throwing stones into the river for the dog to bring back. The animal enjoyed the sport, being a good swimmer and very lively.

Next day, however, the animal was in low spirits and appeared to be quite done up and off its feed. It whined frequently and restlessly, kept on changing its position—lying down and getting up—first in one place, then in another. It had, in short, all the symptoms of colic. Towards evening it began vomiting; it brought up water, saliva and mucus enclosing a pebble.

Examination of the abdomen was evidently painful, the animal hardly allowed himself to be touched. In attempting to lift the dog a dull sound could be located, both by palpation and hearing, in the stomach; this was caused by the swallowed stones rattling together.

The patient was allowed to go free, in the hope that the foreign bodies would be excreted in the natural course or else that they would be vomited up.

The following day the owner declared that the dog had not

vomited again, that it had remained moping in the corner of a room, and that no other stones had been passed.

An emetic was then administered as an injection; it consisted of 12 cg. of hydrochlorate of apomorphia in 5 grm. of distilled water. Five minutes after this injection the dog brought up two big stones, then another an hour afterwards, followed quickly by a fourth. The animal then seemed to be getting exhausted, so it was given some coffee with a little alcohol in it. Palpation of the abdominal region still proved the presence of stones. It was like feeling a bag of nuts. During the evening two more pebbles were vomited forth and the dog became livelier; he laid down and slept till morning, when he was quite lively and hungry, drinking milk with avidity. The retching had ceased; there was no longer any abdominal tenderness and no further rattling of stones in the stomach.

The foreign bodies that this dog had swallowed amounted to seven stones; their total weight amounted to 460 grm.; the heaviest weighed 80 grm., the lightest weighed 50 grm., and their sizes varied between that of a hen's egg and a large walnut.

This case is interesting in several particulars. In the first place it is surprising that such large foreign bodies could get into the stomach of such a small dog. Often much smaller objects stick in the œsophagus, but that is because they get fixed by their roughness or their irregular shapes.

In the dog whose case we have been considering, at every fit of vomiting a column of water came up and pushed a pebble along. This slipped up all the better because it was smooth, rounded and heavy.

On the other hand, the enormous weight of the swallowed stones accounts for the animal's manifest suffering. The expulsion of the pebbles produced by the apomorphia is a curious example of the remarkable adaptability of the cardiac orifice during vomiting. If this had not been effective it would have been necessary to operate on the stomach, because the volume of the foreign bodies would certainly have prevented their passage through the intestines.

Abstract.

ON THE CULTURE OF MALARIAL PARASITES AND *PIROPLASMA CANIS*.

By Professor HANS ZIEMANN.

*Charlottenburg.**

As you know, former experiments to cultivate malarial parasites *in vitro* were fruitless, until in October, 1912, Bass and Johns published in the *Journal of Experimental Medicine* their detailed methods of artificially cultivating those blood parasites. Bass kindly sent me the preparations for my inspection, so that I was able to prove the correctness of his statements, and to give some details which he had not communicated.†

Unfortunately here in Berlin attempts to procure cases of malaria for the culture of parasites were at first fruitless.

My own Culture of Tertian Parasites.

On January 13, 1913, I was called to treat a case of ordinary tertian East African infection, which led to a strong attack of fever at 2 o'clock a.m. In the blood taken on January 16, at 10 o'clock a.m., when the patient was free from fever, I could, by using Bass's method, ascertain a further development of the parasites, but unfortunately a growth of bacteria soon presented itself. Another specimen of blood taken on January 17, at 6 p.m., proved that there were nearly fully developed parasites in the peripheral blood. I could then follow up the development of two-thirds of fully grown tertian parasites up to sporulation and the formation of young schizonts again.‡

Tertian gametes were still to be seen in the evening of January 20, but in most of the culture tubes growth of bacteria had already begun, and these had caused the disappearance of the schizonts. The reason why I did not succeed in cultivating more than two generations was probably that the malarial blood when transplanted cooled down, or that I had given tannate of quinine 1·0 gr. to the elderly patient, who had a diseased liver, before collecting the blood on January 16.

My own Culture of Plasmodium Falciparum.

On March 7 a patient came to me who, a short time before, had been in the Cameroons, West Africa, for two years, and had had fever there several times, but in general felt perfectly well. However, on his voyage to and after his arrival in Germany, he had fever for days and weeks, which he either did not treat at all.

---

* Presented to the meeting of the Society of Tropical Medicine and Hygiene.

† H. Ziemann: "On Bass's Culture of Malarial Parasites (*in vitro*) and its Results," *Zentralbl. f. Bakt.*, Bd. 67, H. 6, 1913.

‡ H. Ziemann: "On the Artificial Subculture (*in vitro*) of Tertian Malarial Parasites," *Deutsch. med. Wochenschrift*, 1913, Nos. 6 and 8.

or with quite small doses of quinine owing to the fear of black-water fever. The patient said he had lost thirty pounds during the last few weeks. General health moderate; in the peripheral blood little and middle-sized signet ring-forms; temperature at 12 noon 37·2° C., at 6 p.m. chills, temperature 38·6° C., and at 8 p.m. 38·8° C.; during the night, perspiration. A medium degree of polychromatophilia, basophilia, and anisocytosis in the blood. Number of red blood-cells, 2,234,000; Hb, 60 per cent. On March 7, at 12 p.m., blood was taken from the vein at the bend of the elbow by means of a Strauss's needle, and collected in a graduated and sterilized tube tilted to one side and defibrinated. Again, as in the case of the tertian, the blood was mixed with a more or less large quantity of 50 per cent. solution of dextrose, that is to say, 0·1 c.c. of the 50 per cent. solution of dextrose was added to 5·6 to 8·10 and 12 c.c. of blood. To these mixtures were also added a 2 per cent. solution of sodium citrate in more or less large quantities. Modification also took place, as the tubes were kept in dark rooms at a temperature of 37° C. or a temperature of 40° C. The mixtures thus prepared were previously centrifuged in centrifugal glasses at about 800 revolutions within five minutes, to drive the leucocytes from the bottom to the top, and then to transfer the leucocyte-free malarial blood from the middle or the bottom of the centrifugal tubes to the serum tubes. As it had already been proved by previous control experiments with the tertian that a distinct re-development of parasites is not possible without an addition to dextrose, only serum containing dextrose was employed, the serum being non-inactivated and inactivated (one hour at 43° C.). The experiment was made with:—

(1) Horses' serum.
(2) Human ascitic serum.
(3) Human blood serum,

and it was proved that the development took place best when inactivated dextrose-ascites serum was added. The layer of serum was most suitable at about 5 cm. high, the height of the transferred layer of malarial blood being at least ½ cm. I kept this culture, not as Bass proposes at a temperature of 40° C., but more advantageously at 37° C., so that one could bring it into the incubator just before the beginning of segmentation of the parasites, at a temperature of 40° C. The culture appears to be most successful when one puts leucocyte-free non-malarial dextrose-blood at the bottom of the serum tube, and then plants the malarial dextrose-blood upon it. To obtain subcultures I mixed one volume of leucocyte-free dextrose malarial red blood corpuscles in sterilized pipettes with about a ten-fold volume of equally leucocyte-free normal dextrose red blood corpuscles and spread this mixture at the bottom of a serum tube. Bass has said that he very seldom succeeded in developing in one and the same culture more than two successive generations of parasites, but I found in my case, in the two tubes where there was dextrose malarial blood with inactivated dextrose-ascitic fluid, even in a six days' old culture, a constantly repeated increase of the para-

sites. Doubtless, also in the six days' old plasmodium culture, a distinct increase of the parasites took place. It is possible that the addition of dextrose made it more easy for the young merozoites to settle down, the red blood-cells having become more viscous. I have previously stated that I, in many thousands of blood examinations in the Cameroons, succeeded only once in obtaining a form of sporulation of *Plasmodium falciparum* in the peripheral blood. It was therefore very interesting to follow up, in the culture, all the different stages of the development. It was proved that the forms of sporulation of the Cameroon *P. falciparum* do not differ at all from the forms of sporulation found in other parts of the Tropics and in Italy. The number of merozoites was from fourteen to eighteen, in most cases sixteen. The development, from one form of sporulation to the other, lasted in the incubator at a temperature of 37° C. about forty to forty-eight hours. At a temperature of 40° C., the development apparently seemed to take a course only a few hours quicker. It is very interesting to note that in the peripheral blood the infection of the red blood-cells was very scanty, whereas in the culture a four to five-fold infection of the red blood-cells was no rarity. It is important, that in the six days old culture containing a fair number of crescents, males as well as females, no trace of a further development was to be seen, nor any indication of parthenogenesis. Sub-cultures could be obtained from the two days old, and in one instance from the four days old, culture according to the method mentioned above. The patient had to take a course of quinine, as the danger of blackwater fever of course existed; the quantity of quinine was daily increased by 0·1 gr. (tannate, later the hydrochloride). Owing to the good food at the Sanatorium and the treatment with small doses of quinine, the temperature rose during the next attack of fever on March 9 at 8 p.m. only to 38° C. The number of schizonts, too, diminished, whereas that of the crescents augmented.

On March 10 the blood was again taken for the purpose of culture. In the peripheral blood at this time only crescents and very few schizonts were observed. In a seven days old culture no young schizonts were found, the development being poor, and the number of dying-off sporulation forms larger than in the first experiment; probably, because owing to the quinine cure and the stay at the Sanatorium, the virulence of the parasites had decreased, or the resistance of the patient increased. On March 16, at 12 a.m., the temperature being 37·2° C., blood was again taken for culture, at a time when there were very scarce signet rings, and rather a large number of crescents in the peripheral blood. In the last culture the development of the schizonts was still more slight than before, nor was there any development of the crescents. The collecting of the peripheral blood had unfortunately taken place a little too late, when the majority of the parasites had already got into the inner organs for sporulation. On March 18, at 6 p.m., there was a temperature of 31° C. From that time steady improvement of the patient's state of health took place, increased doses of quinine being given. On

March 31 the patient was dismissed with orders for further quinine treatment.

The summary of the cases described above is as follows:—

(1) In a malarial blood—taken in a sterilized state, 5 c.c. of it being mixed with one-tenth of a 50 per cent. solution of dextrose—the malarial parasites showed in the culture exactly the same morphological and biological development as in the human organism. In the culture the development of the tertian parasites took place ordinarily at a temperature of 39·5° C. in about thirty-four hours, that of the *P. falciparum* at a temperature of 37° C. in about forty to forty-eight hours. Occasional differences occur in the development of parasites in cultures as well as in the peripheral blood, as some parasites develop sooner and others later.

(2) Besides the normal, strongly developed parasites, forms have been observed in the cultures with vacuolized plasma bodies and pulverous solution of the chromatin, forms that were never seen in the peripheral blood of the patient. Between these dying-off and normal forms there occur all kinds of transitions.

(3) Sometimes these degenerated forms remind one of the quinine forms in which, as is known, a pale colouring and rupture of the plasma body can be observed, whilst the chromatin at first preserves its compactness.

(4) All the dying-off or degenerated forms are taken up by leucocytes. All kinds of leucocytes co-operate in the phagocytosis in the culture, unless they have been removed by an especially careful centrifugalization.

(5) I could not observe in the culture a conjugation of young schizonts as described by Mannaberg and later by Craig.

(6) Up to now my experiments with tertian and *P. falciparum* in cultures have shown no trace of an indication of parthenogenesis or the formation of ookinetes.

(7) The young merozoites seem to stay only a short time extra-corpuscular in the blood plasma. One can see them only when sporulation takes place, and near the sporulating bodies.

(8) I have never seen, in many hundreds of preparations made from the cultures, that the parasites wandered from infected red blood-cells to non-infected ones, as Mary Lawson-Rowley maintains.

(9) Since in my cultures of tertian parasites and of *P. falciparum* the same characteristic and morphological distinctions were found as are admitted for the different kinds of parasites—for instance, Schüffner's dots in *tertiana* parasites, Maurer's spots in *P. falciparum*—the belief of some authorities that the different malarial parasites must be regarded only as varieties of one and the same kind may finally be refuted.

(10) As last year I had myself suffered from a slight recurrence of *P. falciparum*, I could not vaccinate myself with living cultures, but I vaccinated myself with a culture of *P. falciparum* which had died out. This vaccination led only to a slight rise of temperature, 37·8° C., but did not specially alter my general state of health.

(11) Until now I cannot share the belief of Bass that it is

possible to cultivate malarial parasites *ad infinitum* without intervening sexual phases such as occur in the bodies of anopheles.

(12) A report will be made later about experimental influences of light, radium, electricity and the serological analysis as regards diagnosis.

(13) I am prepared to recommend the cultivation of malarial parasites, whenever latent malaria is suspected, so that one might obtain a number of generations of parasites in the culture, and thus demonstrate either the parasites themselves or at least leucocytes containing pigment.

Culture of Piroplasma Canis.

The information Bass has made about the culture of malarial parasites induced me to try, in December, 1912, the cultivation of *Piroplasma canis*. I soon found that the application of Bass's method for the culture of *P. canis* by no means always leads to the desired effect.

Some investigators have already believed that they have seen forms of development of *P. canis* in artificial cultures (Kleine, Nuttal). In the beginning of my research I had no results, and only later, after many experiments, I learned that it was wrong to use dogs with a large number of parasites for the cultures; strong, young dogs, having just got parasites in their peripheral blood, being best fitted for experiment. If there are only larger dogs (more than 3 to 4 months old) at disposal, I recommend that their spleen should be taken out and their blood collected three to four days after the operation (about 30 to 50 c.c. of blood according to the size of the dogs) from the *vena jugularis*. The infection is then always successful.

Similarly to what I found in cultivating tertian parasites and *Plasmodium falciparum*, my experiments again were extremely variable, for I mixed the *Piroplasma canis* blood with human ascitic fluid, human blood serum, dogs' blood serum, horses' blood serum, all of them partly inactivated, partly non-inactivated and partly mixed with sodium citrate in more or less large quantities, and kept the cultures at room temperature, at 37° C., and 40° C. The most favourable results were obtained by using the following technique: One lays open the carotid of a young, strong dog, having yet very few parasites in its blood, and taking the blood by means of a sterilized glass cannula, allows it to run into graduated cylinders with a small neck. It is then defibrinated carefully and for a long time, because the production of air bubbles must be avoided. After this the coagulated fibrin is removed and to each 5 c.c. of blood is added 1 to 10 c.c. of 50 per cent. solution of dextrose (formerly I added that quantity to 8 c.c. of blood), and to 10 c.c. of blood 0·3 c.c. of a 2 per cent. solution of sodium citrate. Then one centrifuges just as in the culture of the malarial parasites, and takes with a pipette the leucocyte-free piroplasma-blood out of the middle or the bottom of the centrifuged tubes and plants it at the bottom of the serum in the culture tubes, which are filled with at least

5 c.c. highly inactivated sodium citrate, dextrose dogs' blood serum, or sodium citrate dextrose ascitic serum. It is best not to make the layers of the red blood-cells too thin, and to proceed just as in the culture of the malarial parasites. It is possible also to get excellent cultures at a temperature of 40° C., and at room temperature. In these a distinct augmentation of the parasites can be observed, but I saw the best development of parasites, especially of chromatins, at a temperature of 37° C., and when I added sodium citrate. After twenty-four hours a considerable increase of the parasites can be observed in the same blood that in the dog itself showed only a very slight infection. Forms of sporulation with more than four merozoites are very rarely to be seen in the peripheral blood, but in successful cultures forms of schizogony with sixteen and more merozoites are seen. In this way it is possible to keep the culture alive up to the fifth, or even to the sixth day, but already after the second day some degenerated forms appear which become more frequent after the third day. Nevertheless, I succeeded in mortally infecting a dog by an intravenous injection in the jugular vein taken from a three days old sub-culture, which in turn was taken from a two days old culture. In one instance I also succeeded in getting sub-cultures from a four days old culture. Even a four days old sub-culture tainted by bacteria showed itself virulent the other day by intravenous injection. If the growth of bacteria in a culture has lasted more than twenty-four hours, however, a quick dying-off of the parasites can be observed, just like in the cultures of malarial parasites. The contamination of the culture by blastomycetes does not damage the parasites so quickly. As soon as degeneration takes place, the piroplasmata lose their typical pear-shape, turn roundish, the plasma body becomes of a darker colour, and the colouring of the chromatin ceases. At the same time some parts of the plasma body may come off in the form of small particles or little threads; later the degenerated parasites are ingested by leucocytes.

I shall report about serological, diagnostical, &c., experiments elsewhere.

PETROLEUM INTERNALLY.

By W. TEN HOOPEN.

Groningen.

In cows which suffer from chronic lung trouble treatment was very gratifying by use of 15 to 30 grm. of petroleum given once daily in a wine bottleful of milk. In animals treated for a few days coughing ceased, condition improved, and in the course of a few weeks they were restored to perfect health. Some advanced cases were cured by this therapy. The affected animals before treatment showed frequent dry cough, great emaciation, sparse milk supply and diminished appetite.

Translations.

TAXUS POISONING.

By Professor B. BANG, M.D.

An eight-months-old calf was found dead on the morning of January 4 by its owner, Grut Hansen, of Kolle-Kolle. *Post-mortem* by the veterinary surgeon showed an inflamed rumen. On the same evening at seven o'clock a six-months-old calf died, and a few hours later two of the other calves stumbled headlong and fell, but got up again, however. In the afternoon the calves were dull and blown up and ate less than usual. A few days later the four remaining calves recovered. The second calf that died was examined *post mortem* on January 5. The rumen was filled with food. This was mixed with a quantity of taxus leaves, partly isolated and partly aggregated, which were easily recognized by their dark-green, flat needle-shaped appearance. The mucosa of the rumen was intensely inflamed; the epithelium had become detached, or was easily detachable. No exudation into the wall. Nothing abnormal in the other stomachs or intestine and spleen natural.

Liver and kidneys full of blood. Punctiform hæmorrhages in the thymus gland, the glands of the neck, as well as on the bronchial mucosa, and on the external surface of the heart; some blood in the bronchi. In the heart rather loose dark coagula. The brain was divided, but its tissues were not specially inflamed.

The calves had been put into an enclosure during the day where some clippings from the garden shrubs and trees had been placed on January 2. Here were found clippings of sorrel, laburnum, taxus, box, cypress, and jasmine, and the owner had already suspected that poisoning had resulted from one of these plants. He had taken the temperature of the calves at eight o'clock in the evening, and found them from 38·4—39·2° C. The author had had previous experience of taxus poisoning in Denmark.

In the year 1892 four heifers out in a meadow died suddenly at Lolland. They were only ill a few minutes, or perhaps a quarter of an hour. A suspicion of anthrax arose. On *post-mortem* yew leaves and branches were found in the rumen, and it was shown that the heifers had broken loose shortly before their illness and had nibbled at some yew trees that were accessible.

On March 28, 1908, Veterinary-Surgeon Tauber relates a case where two foals let loose in the evening did not return to their stalls. On the next morning they were found quite comfortably housed on a neighbouring farm. At half-past eight they were brought into the stable and were lively and ate well. At half-past nine they were found dead in their stalls. Apart from "indication of a serious infiltration along the colic mesentery" in one foal, and considerable hæmorrhagic changes in some of the lymph glands of the other foal, nothing abnormal was found. In the contents of the stomach there were yew leaves and twigs. On

inquiry by the veterinary surgeon on the next day it was found that the foals had eaten of the yew leaves in a garden.

Tauber relates a case also where a six-year-old cart-horse put under a yew tree for ten minutes ate the leaves and branches and was dead two hours afterwards.

Taxus poisoning has been recognized for over 100 years, and Erik Viborg mentions cases that occurred in 1797. Different views, however, prevail as to the injurious effects of yew leaves. Viborg states that in Hessen yew leaves are used as a winter food, but the peasants recognize the danger of them if they are not given gradually to stock. They are never given without admixture with other foods. Experiments by Viborg on horses, cattle, sheep, goats, swine, dogs, cats, hens, geese and ducks show that the effects of taxus depend on whether it is taken on an empty stomach or mixed with oats. Single horses succumbed after taking one pound of fresh leaves. Swine are most susceptible. Flesh eaters, ducks and geese do not die, as they vomit up the leaves; the remaining animals die after a proportionately large dose (for swine about eighty grammes, for hens about forty grammes), showing attempts at vomiting, dulness, dizziness and convulsions. Viborg's experiments caused a circular to be issued in Denmark calling attention to the danger of yew to most animals; but experience had shown that cows might become accustomed to it if given with other food.—*Deutsche tierärzt. Woch.*

ON THE CAUSE AND SYMPTOMS OF SYMPTOMATIC URTICARIA OF THE OX.

By J. NEUENSCHWANDER.

Veterinary-Surgeon in Grünenmatt.

Urticaria of cattle is a quite frequent ailment occurring in my practice, being well known to the owners of animals under the name of "hell-fire." It presents itself in an alarming form, although, as a rule, harmless enough. It shows itself generally by œdematous swellings in the head, dewlap, rectum and perinæum, and eruptions on the shoulders and back. Lately a case has occurred with me which is of special interest, as well from the point of view of the cause as also on account of the little known symptoms.

A valuable cow belonging to J. W., in F., was announced to me by telephone as ill, with the remark that she had a foreign body in her œsophagus. Subsequent examination showed that the animal's tongue was stretched out of her mouth; there was great distress in breathing. At first I suspected anthrax, but since the temperature was 38·9 and the pulse 66 this diagnosis was given up. On closer examination of the mouth the ligament of the tongue, the mucous membrane of the mouth and pharynx were highly swollen œdematously, a circumstance little noted until now. Zipperlen describes a case where the conjunctivæ, the rectal and vaginal mucosæ were involved, which

observations were confirmed by Schindelka. Such severe swelling of the mucosa of the mouth and pharynx has never occurred with me before, nor do I find any previous records of such, consequently at first I did not diagnose urticaria, but ascribed the case to an insect sting (bee or wasp) and ordered cautious administration of draughts of milk. The owner advised me that the animal had been left unmilked. As I have often noticed urticaria in animals being dried and generally on the second day after not milking, I now immediately suspected this complaint, and subjected the animal to a thorough examination which showed (1) that the dewlap was as hard as a board; (2) that elevations as big as a pigeon's egg had formed on the shoulders; (3) rectum slightly swollen. Now my diagnosis was urticaria. Therapy: immediate milking out, letting out to graze at will. On the next day all the elevations, as well as the œdematous swelling, had gone and the patient seemed quite right again.

My view as to the cause is to be found in the sudden interruption of lactation, on account of which a certain toxin formed in the udder, which by resorption had an injurious influence on the circulation of the blood. I support this view by the fact that this disease often occurs in cows left unmilked in the autumn, although no change of food has been given; also even in grass-fed cattle. At times I have noticed certain animal families whose members, on interruption of lactation, always suffered from urticaria, and also possessed a certain predisposition which was transmitted to future generations.—*Schweizer Archiv für Tierheilkunde.*

Review.

The Common Colics of the Horse. By H. Caulton Reeks, F.R.C.V.S. Third Edition, pp. 369, with 32 figures in the text. Price 6s. net. Published by Baillière, Tindall and Cox, London.

When Mr. Reeks made a special study of the treatment of colic in horses he commenced a task of which every veterinarian, engaged in private practice, knows the importance and magnitude; for "colic," although one of the commonest of everyday conditions which the practitioner meets with, is also one of the most dreaded and serious.

"Colic" may signify almost anything, in that the term is applied to a slight attack of abdominal pain and it is also applied to the acute agony caused by the presence of a stone or a twist of the bowel. To classify correctly and accurately the colics of the horse needs a lifelong experience, and those who study Mr. Reeks's book on the subject must at once become keenly interested and acknowledge that the profession owes him a deep debt of gratitude.

The fact that the book has already run through three editions and two reprints since 1902 is sufficient proof that it was much needed and has been much appreciated.

The subject is treated thoroughly and in detail right from the start, a most interesting and clever chapter being devoted to the variations in symptoms and treatment in the young and unbroken colt as compared with the older working animal; and it is easy to see throughout that the whole of the work emanates from the brain of a "practical" man, who has also the advantage of the possession of sufficient enthusiasm to enable him to consider in a sensible way anything which may come before his notice and to discard all impossible and useless theories.

Always an advocate of the stimulus treatment of colic, it was Mr. Reeks who first drew attention to the abuse of sedatives, and who, by his writings, has practically revolutionized ideas in this direction—to the benefit, undoubtedly, of equine patients in every part of the world.

ERRATUM.

In The Veterinary Journal for March it was stated, when writing of Mr. Prentice, M.R.C.V.S., the Chief Veterinary Officer of the Department of Agriculture, that he was a graduate of the "Irish" Veterinary College. This should have read the "Dick" Veterinary College.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.